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CLAIMS

WHAT IS CLAIMED IS:

- A
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1. A valve assembly, comprising:
a valve body having a passage defining a first axis, and a bore defining a second axis arranged generally coplanar with and normal to the first axis, the bore having an inner surface defined by an inner periphery thereof; and
a valve element mounted in the bore for rotation about the second axis between a closed position, wherein the valve element cooperates with the inner surface of the bore to obstruct movement of product through the passage, and an open position, wherein the valve element is positioned relative to the inner surface of the bore so as to permit product movement through the passage.
 2. A valve assembly according to claim 1, wherein a diameter of the bore is equal to or greater than a distance measured across any two diametrically opposed locations defined by a marginal edge of the passage.
 3. A valve assembly according to claim 1, wherein the valve element includes a seal structure extending lengthwise of and generally parallel to the axis of rotation of the valve element.
 4. A valve assembly, comprising:
a valve body having a passage defining a first axis, an inlet end, and an outlet end, and a bore defining a second axis disposed in crossing relation to the first axis and between the inlet end and the outlet end of the passage; and
a valve element mounted in the bore for rotation about the second axis between a closed position, wherein the valve element cooperates with an inner surface of the bore to obstruct movement of product through the passage, and an open position, wherein the valve element permits product movement through the passage, wherein a diameter of the bore is substantially equal to or greater than a distance measured across that portion of the passage which the valve element is adapted to close.

5. A valve assembly according to claim 4, wherein the second axis is generally coplanar with and normal to the first axis.

6. A valve assembly according to claim 4, wherein the valve element includes a seal structure extending lengthwise of and generally parallel to the axis of rotation of the valve element.

7. A valve assembly, comprising:

a valve body having a passage defining a first axis, and a bore defining a second axis disposed in crossing relation to the first axis, the bore having an inner surface defined by an inner periphery thereof; and

a valve structure including a pair of radial flanges disposed at opposed ends with a solid web member extending therebetween, the radial flanges being configured to mount the valve structure within the bore for rotation about the second axis between a closed position, wherein the valve structure cooperates with the inner surface of the bore to obstruct movement of product through the passage, and an open position, wherein the valve structure is positioned relative to the inner surface of the bore so as to permit product movement through the passage.

8. A valve assembly according to claim 7, wherein the web member is generally rectangular in shape.

9. A valve assembly according to claim 7, wherein a diameter of the bore is substantially equal to or greater than a distance measured across that portion of the passage which the valve structure is adapted to close.

10. A valve assembly according to claim 7, wherein the second axis is generally coplanar with and normal to the first axis.

11. A valve assembly according to claim 7, wherein the valve structure includes a seal structure extending lengthwise of and generally parallel to the axis of rotation of the valve structure, such that when the valve structure is in the closed position, the valve structure and the bore create a straight line seal therebetween so that a force created between the seal structure and the bore along the seal line does not substantially increase or vary as the seal structure rotates between the open and closed positions, thereby enhancing ergonomic operation of the valve structure.

12. A valve assembly according to claim 11, wherein the seal structure applies a wiping action to the cooperative inner surface of the bore as the valve structure moves between the open and closed positions.

13. A valve assembly according to claim 7, wherein the valve structure includes a seal structure having a first seal portion extending lengthwise on one side of the web member and generally parallel to the axis of rotation of the valve structure, a second seal portion extending lengthwise on an opposite side of the web member and generally parallel to the axis of rotation of the valve structure, a third seal portion extending around one of the radial flanges, and a fourth seal portion extending around the other radial flange, thereby creating a seal between the valve structure and the bore to prevent movement of product therewith when the valve structure is in the closed position.

14. A valve assembly according to claim 13, wherein the web member and flanges each include an appropriate slot adapted to receive the respective seal portion.

15. A valve assembly according to claim 13, wherein the seal structure is made of a single piece of material.

16. A valve assembly according to claim 13, wherein the seal structure is an elastomeric seal.

A (1)
17. A valve assembly, comprising:

a valve body having a generally cylindrical passage defining a first axis, and a generally cylindrical bore defining a second axis arranged generally coplanar with and normal to the first axis;

a valve structure including a pair of radial flanges disposed at opposite ends with a generally rectangular solid web member extending therebetween, the radial flanges being configured to mount the valve structure within the bore for rotation about the second axis between a closed position, wherein the valve structure cooperates with the bore to obstruct movement of product through the passage, and an open position, wherein the valve structure cooperates with the bore to permit product movement through the passage; and

wherein a diameter of the bore is equal to or greater than a distance measured between any two diametrically opposed locations on a marginal edge of the passage.

18. A valve assembly according to claim 17, wherein the valve structure includes a seal structure extending lengthwise of and generally parallel to the axis of rotation of the valve structure, such that when the valve structure is in the closed position, the valve structure and the bore create a straight line seal therebetween.

19. A valve assembly according to claim 17, wherein the valve body and the valve structure are each made of a nylon material.

20. A valve assembly according to claim 17, further including stops for limiting movement of the valve structure between the open and closed positions.

21. A valve assembly according to claim 17, further comprising a rotation assistance device positioned on one end of one of the flanges to allow the valve structure to be rotated between the open and closed positions.

22. A valve assembly for use with a product holding container, the valve assembly comprising:

a valve body having a generally cylindrical passage defining a first axis, and a generally cylindrical bore defining a second axis arranged generally coplanar with and normal to the first axis;

a valve structure including a pair of radial flanges disposed at opposite ends with a generally rectangular solid web member extending therebetween, and a seal structure extending lengthwise of and generally parallel to opposite sides of the web member, the radial flanges being configured to mount the valve structure within the bore for rotation about the second axis between a closed position, wherein the seal structure cooperates with the bore to obstruct movement of product through the passage, and an open position, wherein the valve structure cooperates with the bore to permit product movement through the passage; and

wherein a diameter of the bore is equal to or greater than a distance measured between any two diametrically opposed locations on a marginal edge of the passage.

23. A valve assembly according to claim 22, wherein the product holding container is a liquid container having an outer container in surrounding relation to an inner container, and wherein the valve body includes an outer flange member adapted to facilitate attachment of the valve body to the inner container.

24. A valve assembly according to claim 22, wherein the seal structure has a first seal portion extending lengthwise on one side of the web member and generally parallel to the axis of rotation of the valve structure, a second seal portion extending lengthwise on an opposite side of the web member and generally parallel to the axis of rotation of the valve structure, a third seal portion extending around one of the radial flanges, and a fourth seal portion extending around the other radial flange, thereby creating a seal between the valve structure and the bore to prevent movement of product therewith when the valve structure is in the closed position.

25. A valve assembly according to claim 24, wherein the web member and flanges each include an appropriate slot adapted to receive the respective seal portion.

26. A valve assembly according to claim 24, wherein the seal structure is made of a single piece of material.

27. A valve assembly according to claim 24, wherein the seal structure is an elastomeric seal.

28. A valve assembly according to claim 22, wherein the valve body and the valve structure are each made of a nylon material.

29. A valve assembly according to claim 22, further including stops for limiting movement of the valve structure between the open and closed positions.

30. A valve assembly according to claim 22, further comprising a rotation assistance device positioned on one end of one of the flanges to allow the valve structure to be rotated between the open and closed positions.